Docket No. DEP5050USPCT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appellants	:	Richard Farrar et al	Confirmation No.:	2006
Appln. No.	:	10/566,147	Art Unit :	3738
Filed	:	August 4, 2009	Examiner :	Stewart, Jason-Dennis
Title	:	KNEE JOINT PROSTHESIS		

CERTIFICATE OF TRANSMISSION			
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Commissioner for Patents
P.O. Box 1450
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APPEAL BRIEF

Dear Sir:

This Appeal Brief is filed in response to the Notice of Appeal, which was filed by Appellants in the U.S. Patent & Trademark Office on June 30, 2011, in response to the Final Office Action of March 2, 2011.

Real Party In Interest:

By virtue of an assignment recorded at reel/frame 022944/0609, the real party in interest for this patent application is DePuy International Limited, St. Anthony's Road, Beeston, Leeds, West York, Great Britain, which is an affiliate of Johnson & Johnson, a New Jersey corporation.

Related Appeals and Interferences:

There are no related appeals or interferences known to Appellants, the Appellants' legal representative, or the Assignee that will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

Status of Claims:

Claims 1-15 have been cancelled.

Claims 16-46 are pending, have been finally rejected, and are hereby appealed.

Status of Amendments:

A Request for Reconsideration was filed May 2, 2011 ("Request for Reconsideration"), after the final rejection that requested the Examiner to reconsider in particular the anticipation rejection. The Examiner issued an Advisory Action on March 23, 2011 ("the Advisory Action"), stating that the request for reconsideration was not persuasive, though appeared to change the basis of the rejection by stating that "the change in contact area between the post of the tibial component and the cam of the femoral component are functional limitations and have limited patentable weight in the absence of differentiating structure". Appellants proceed to address this statement and to appeal on the claims presented in the amendment dated December 27, 2010, the amendment that prompted the final rejection dated March 2, 2011 ("the Final Office Action").

Summary of Claimed Subject Matter:

Independent Claim 16

The present invention, as exemplified by independent claim 16, is directed to a knee joint prosthesis for implantation in a knee joint that connects a femur and a tibia having a tibial axis. The prosthesis includes a tibial component 6 and a femoral component 2 (Page 8, lines 17-19 and Figure 1). The tibial component 6 has an upper surface and a post 26 extending from the upper surface in a direction extending generally upwardly from the upper surface (Page 9, lines10-12, Figure 1). The post 26 has a post bearing surface 28 (Page 9, lines12-13, Figure 1). The femoral component 2 has a medial condyle 14, a lateral condyle 16, and a cam 32 having a cam surface (Page 9, lines12-28, Figures 1, 3, 5a, 5b). The post bearing surface 28 and the cam surface define a "surface area of contact". The medial condyle 14 and the lateral condyle 16 are dimensioned such that they act against the upper surface of the tibia component 6 and the "surface area of contact" increases when the knee flexes to a flex angle greater than 120° (Page 11, lines 5-10, Figure 6 and 7).

Independent Claim 40

The present invention, as exemplified by independent claim 40, is directed to a knee joint prosthesis for implantation in a knee joint that connects a femur and a tibia having a tibial axis. The prosthesis includes a tibial component 6 and a femoral component 2 (Page 8, lines 17-19 and Figure 1). The tibial component 6 has an upper surface and a post 26 extending from the upper surface in a direction extending generally upwardly from the upper surface (Page 9, lines10-12, Figure 1). The post 26 has a post bearing surface 28 (Page 9, lines12-13, Figure 1). The femoral component 2 has a medial condyle 14, a lateral condyle 16, and a cam 32 having a cam surface (Page 9, lines12-28, Figures 1, 3, 5a, 5b). The post bearing surface 28 and the cam

surface define a "surface area of contact". The medial condyle 14 and the lateral condyle 16 are dimensioned such that they contact the upper surface of the tibia component 6 and the "surface area of contact" increases when the knee is flexed to an angle greater than 120° (Page 11, lines 5-10, Figure 6 and 7).

Grounds of Rejection To Be Reviewed On Appeal:

A) Whether the final rejection stating that claims 16-19, 25-27, 31, 40-43, and 46 are anticipated under 35 U.S.C. §102(e) should be reversed.

B) Whether the final rejection stating that claims 20-24, 28-30, 32-39, 44 and 45 are unpatentable under 35 U.S.C. §103(a) should be reversed.

C) Whether the change in contact area between the post of the tibial component and the cam of the femoral component at certain degrees of flexion is entitled to patentable weight .

Argument:

The Examiner in the Advisory Action advised Appellants that the arguments made in the Request for Reconsideration failed to persuade the Examiner. Rather than reiterating the previous rejections, the Examiner stated that the "change in contact area between the post of the tibial component and the cam of the femoral component are functional limitations and have limited patentable weight in the absence of differentiating structure". As a result, it is unclear whether the Examiner has withdrawn the set of rejections described in the Final Office Action in favor of this position or not. Appellants will address the rejections in the Final Office Action and then speak to the issue raised in the Advisory Action.

A. Rejection of claims 16-19, 25-27, 31,40-43, and 46 under 35 U.S.C. §102(e)

The Examiner has finally rejected claims 16-19, 25-27, 31,40-43, and 46 under 35 U.S.C. 102(e) as being unpatentable over U.S. Publication No. 2002/0010512 to Takei (hereinafter referred to as "Takei").

Claim 16 claims a knee joint prosthesis that includes a tibial component comprising an upper surface, a post extending from the upper surface in a direction extending generally upwardly from the upper surface, the post having a post bearing surface; and a femoral component comprising a medial condyle, a lateral condyle and a cam having a cam surface, wherein (i) the post bearing surface and the cam surface define a surface area of contact and (ii) the medial condyle and the lateral condyle act against the upper surface, and wherein the surface area of contact increases when the knee flexes to a flex angle greater than 120°.

Claim 40 claims a knee joint prosthesis that includes a tibial component comprising an upper surface, a post extending from the upper surface in a direction extending generally upwardly from the upper surface, the post having a post bearing surface; a femoral component comprising a medial condyle, a lateral condyle and a cam having a cam surface, wherein (i) the post bearing surface and the cam surface define a surface area of contact and (ii) the medial condyle and the lateral condyle contact the upper surface, and wherein the surface area of contact increases when the knee is flexed to an angle greater than 120°.

As is indicated in the underlined portions of independent claims 16 and 40, above, Appellants each claim a knee joint prosthesis that has a first surface—the post bearing surface of the tibial component—and a second surface—the cam surface of the femoral component—that define a surface area of contact between them. The defined surface area of contact between these two surfaces increases when the knee is flexed to angles greater than 120°.

Takei does not describe, disclose or make obvious at least these elements of the independent claims 16 or 40, nor does it describe, disclose or make obvious the invention claimed in claims 17-19, 25-27, 31, 41-43 and 46, the claims that depend from independent claims 16 or 40.

Appellants submit that the Examiner has failed to state a prima facie case of anticipation. As the Examiner states at page 3 of the Final Office Action, Takei contemplates that its knee flexes to angles greater than 120°. In fact, Takei states at paragraphs 9 and 45 of the publication that the Takei knee flexes to approximately 150°. Takei, however, fails to describe the "surface area of contact" element of either claim 16 or claim 40. To that point, the Examiner simply states at page 3 of the Final Office Action that Takei discloses that "the surface area of contact increases between the tibial post and the cam of the femoral component at flexion angles greater than 120 degrees compared at least to the surface contact area at full extension (Fig. 3) (Claim 1, 40)." Upon review of the Takei publication, including Figure 3 cited by the Examiner, however, this simply is not the case. In contrast, Takei states at paragraph 45:

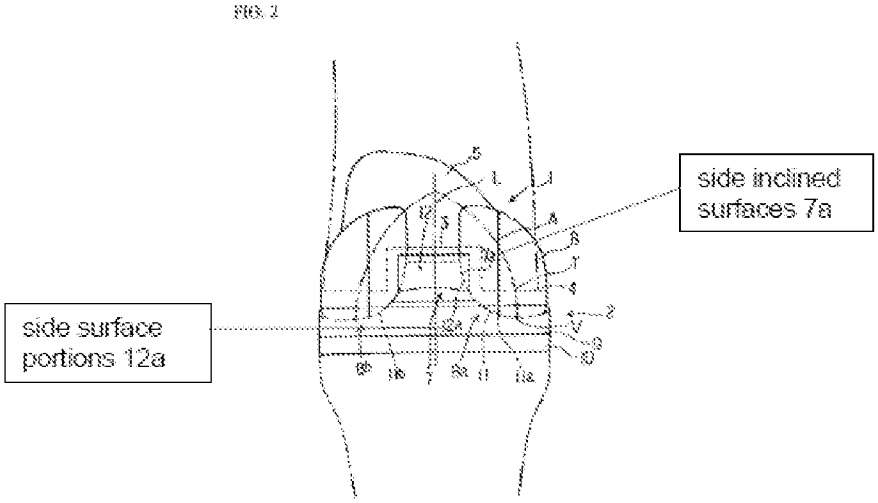
> In concrete terms, the femoral condylar portion 8 rotates relative to the tibial condylar portion 11 while a state in which these portions are in contact is maintained (i.e., while forward movement is restricted). This rotation is performed from a standing position of 0° to a Japanese-style upright sitting position of 150°. Accordingly, the shapes of the cam 14 and rear inclined portion 12d are designed in order to make this possible. Furthermore, ***contact between the side surface portions 12a of the post 12 and the side inclined surfaces 7a of the pocket 7 is maintained during this rotation, so that a tight movement with the post 12 as a pivot is guaranteed, and so that the contact surface area is increased***, thus lowering the surface pressure, so that wear, etc., is reduced.

(emphasis added.) Takei fails to anticipate claims 16 or 40 for at least two reasons. First, while Takei describes that a contact surface area increases during rotation, the contact surface area described in Takei is that area of contact between the side surface

portions 12a of post 12 and the side inclined surfaces 7a of pocket 7, and not the "surface area of contact" claimed in claims 16 and 40; i.e., the surface area of contact between the post bearing surface and the cam surface. Takei thus increases contact surface area by using the side surface portions 12a of post 12, but not the cam surface as claimed in independent claims 16 and 40. The side inclined surfaces 7a of Takei clearly do not form part of the cam, which is referenced as element 14 in Takei. Indeed, as described in the text of Takei at paragraph 42, the pocket side surfaces 7a and the cam 14 are described as distinct:

> The side surface portions 12a of the post 12 are in contact with the side inclined surfaces 7a. Furthermore, as seen in from FIG. 3 that is a side view, a funnel-shaped dropping portion 7b is formed in front of the pocket 7, ***and a hemispherical cam 14 is formed in the rear side of the dropping portion 7b*** with a foot portion 7c disposed in a high position interposed.

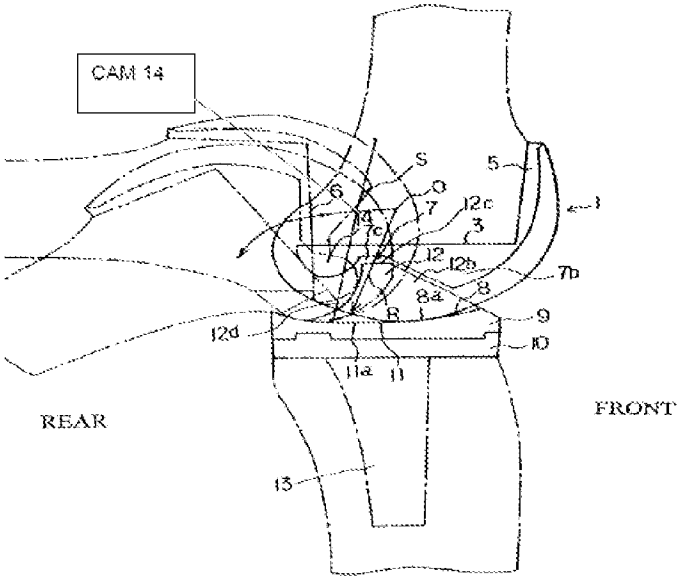
Takei, paragraph 42 (emphasis added). Thus, the side inclined surfaces 7a are not a part of cam 14. Cam 14 instead "is formed in the rear side of the dropping portion 7b". Takei, paragraph 42. Takei depicts cam 14 and the side inclined surfaces 7a in Figures 2 and 3, shown immediately below.



As is depicted above, side inclined surfaces 7a (highlighted) are shown as running "along the curvature of the protruding surfaces of the femoral condylar portion 8".

Takei, paragraph 42. Side inclined surfaces 7a are shown as contacting post side surface portions 12a. Takei, paragraph 42. But, as described in paragraph 42 of Takei and shown in Figure 3 below, cam 14 is a distinct part of the femoral component and the inclined side surfaces 7a do not form part of cam 14.

FIG. 3



The reference number of cam 14 is highlighted to make it easier to discern the location of the cam. Thus an increase in surface area between the side inclined surfaces 7a and the post 12 in Takei fails to describe the increase in "surface area of contact" claimed in independent claims 16 and 40.

Second, there is no disclosure anywhere in Takei that ***any surface area of contact***, including contact surface area between the side inclined surfaces 7a and the post 12a, increases when the knee flexes to an angle greater than 120 degrees. Instead, with reference to paragraph 45 of Takei, the contact between the post and cam of Takei is simply described as being "maintained" during the rotation of the knee between 0° and 150°:

> Furthermore, contact between the side surface portions 12a of the post 12 and the side inclined surfaces 7a of the pocket 7 ***is maintained***

> ***during this rotation***, so that a tight movement with the post 12 as a pivot is guaranteed, and so that the contact surface area [as distinguished from the claimed surface area of contact] is increased, thus lowering the surface pressure, so that wear, etc., is reduced.

Takei, paragraph 45. Indeed, there is no explanation in Takei of how the surface area of contact increases, or more pointedly that the "surface area of contact" as claimed in the instant application—the surface area of contact between the post bearing surface and the cam—increases above angles of greater than 120°.

Finally, and importantly, where Takei does describe how the cam and the post interact, it describes a conventional interaction:

> The cam 14 formed in the pocket 7 and the rear inclined portion 12d of the post 12 that acts on the cam 14 control the sliding movement and rolling movement during this flexing operation, so that the attitudes of the sliding movement and rolling movement are stabilized.

Takei, para 44. Thus, when describing the cam and post interaction in Takei, there is no reference to an increase in the surface area of contact at any angle between these two elements. Instead, the cam and post are described as controlling the sliding and rolling movement when the tibial and femoral components are flexed. This distinction is significant since Takei completely fails to recognize the importance and benefit of using the post to bear increased load by increasing the "contact surface area" at angles above 120°.

The Examiner cannot discharge the burden of stating a prima facie case of anticipation simply by stating that Takei discloses the claimed element in Figure 3 without further explanation. Such a statement is not sufficient, Appellants do not believe this is the case and, consequently, Appellants request the Board to overturn the rejection in connection with independent claims 16 and 40, and the claims that depend from claim 16 and 40.

B. Rejection of claims 20-24, 28-30, 32-39, 44 and 45 under 35 USC §103(a)

The Examiner has finally rejected claims 20-24, 28-30, 32-39, 44 and 45 under 35 U.S.C. 103(a) as being unpatentable over U.S. Publication No. 2002/0010512 ("Takei") in view of U.S. Publication No. 2003/0023314 ("Burstein").

As described above, Appellants argue that claims 16 and 40 are patentable over Takei. Further, Burstein does not disclose the "surface area of contact" limitations described in claims 16 and 40. As a result, claims 20-24, 28-30, 32-39, 44 and 45 are also patentable at least because they depend ultimately from either claims 16 or 40. Therefore, Appellants seek that this rejection be overturned as well.

With respect to the proposed combination of Burstein with Takei, the Examiner states at page 4 of the Final Office Action that "Burstein '314 also illustrates a tibial post that is ***convex*** when viewed along the axis of the tibial axis (Fig. 4)" and indicates that such a description renders claim 20 obvious in view of Takei. Appellants submit that Burstein does not disclose a tibial post that is convex when viewed along the axis of the tibial axis. The post of Burstein is described as follows:

> A stabilizing post 42 extends upward from the plateau portion 30 between the concavities 32, 34 and is positioned to be received in the intercondylar recess 16 when the components are assembled. The post 42 is generally triangular in lateral profile and has flat, parallel side surfaces 42b, ***a concave cam surface 42a at the inferior part of the posterior surface,*** and an anterior surface which slopes anteriorly and superiorly at an acute angle to a nominal reference plane perpendicular to the nominal axis of the extended leg. The side surfaces of the stabilizing post 42 are in sufficient clearance from the lateral walls of the femoral intercondylar recess to allow normal lateral angulation and rotation of the prosthetic knee joint.

Burstein, paragraph 19 (emphasis added). Thus, the surface of the post of Burstein, termed the "cam surface" is described as being "concave". Note that Burstein does not follow the same convention as that adopted in the current application when

describing the cam. Rather than describe element 20 depicted in Figures 2 and 3 as the cam (as it would be in the current application or in Takei), element 20 is termed the "cam follower". The cam element of Burstein instead is formed by the post and is described as "a concave cam surface 42a". Referring to the Burstein figures, Figure 4 depicts a plan view and Figure 5B depicts a side elevational view of the post 42:

FIG. 4

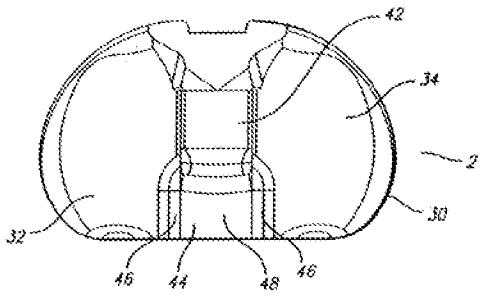
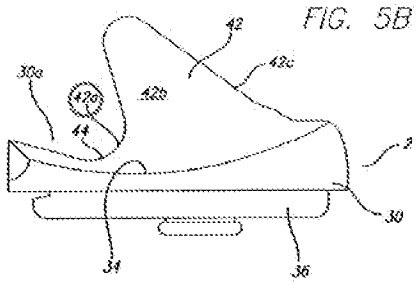


FIG. 5B



Element 42a as shown in Fig 5B clearly depicts the concave aspect of the post. In contrast with the Examiner's contention that Burstein illustrates a tibial post that is ***convex*** when viewed along the axis of the tibial axis (Fig. 4), Appellants can locate no convex surface on the post where a femoral cam (or cam follower as termed in Burstein) would contact the post. Thus, with respect to dependent claims 20 and 44, and the claims that depend therefrom (in addition to not showing a prima facie case with regards to the independent claims that claims 20 and 44 depend from), the Examiner has recited no prior art that discloses the claimed invention.

The Examiner contends that "Burstein '314 teaches a cam … with a substantially flat surface 20b and a concave section in its cross section (Fig. 3) (Claims 29, 30, 44). Appellants further submit that Burstein at least fails to describe the elements claimed in claims 29 and 30, which claim particular features of the cross-section of the cam. Burstein does not describe how the shape of the cam changes as the flex angle between the tibial and femoral components changes. As a result, Burstein cannot describe claims 29 and 30, which each describe the shape of the cam surface when it contacts the post bearing surface at flex angles greater than 120°.

Further, even if Burstein disclosed the elements that the Examiner argues are disclosed in Burstein, one skilled in the art would not be motivated to combine Takei and Burstein. The Examiner states at page 4 of the final Office Action:

> It would have been obvious to one [of] ordinary skill in the art at the time of the invention to modify the cam of Takei with the concave bearing surface of the cam of Burstein '314 in order to increase the "jumping height" of the femur with respect to the tibia at high flexion angles as taught by Burstein '314 (paragraph 25) and transmit a load to properly stabilize the joint (paragraph 6).

The stated reason for the combination is to modify the cam of Takei with the concave bearing surface of the cam of Burstein to increase the 'jumping height' at high flexion angles. However, the cam of Takei is located on the femoral component—refer to element 14 of Figure 3 of Takei above—and the concave cam surface 42a is part of the post of Burstein. See Figure 5B above. Appellants submit that it is not understood how one of skill in the art would combine the cam of the Takei with the concave surface of the post of Burstein.

For the foregoing reasons, Appellants seek reversal of the obviousness rejection.

C. The Change in Contact Area Between the Post and the Cam is Entitled to Patentable Weight

In addition to the rejections listed in the Final Office Action, the Examiner argues by way of the Advisory Action, that the surface area of contact element is not structural and thus not entitled to patentable weight in the absence of differentiating structure. Page 2 of the Advisory Action states:

> The request for reconsideration does NOT place the application in condition for allowance because: Applicant's arguments were not persuasive. The change in contact area between the post of the tibial component and the cam of the femoral component are functional

> limitations and have limited patentable weight in the absence of differentiating structure.

Advisory Action, page 2. As stated above, it is unclear whether the Examiner has withdrawn the other bases of the final rejection and is now relying solely on this argument.

At the outset, Appellants submit that the "surface area of contact" element is structural and that a change to the defined surface area of contact is also structural. As §2173.05 of the MPEP states: "A functional limitation is an attempt to define something by what it does, rather than by what it is (e.g., as evidenced by its specific structure or specific ingredients)." Further on, it states: "A functional limitation is often used in association with an element, ingredient, or step of a process to define a particular capability or purpose that is served by the recited element, ingredient or step." MPEP §2173.05. The claim element in question does not "define a particular capability or purpose". If the claimed element *were* to define a particular capability or purpose, it might cite the benefit cited in the Specification at page 3, lines 18-20: "The larger area of contact contributes to greater stability of the joint prosthesis at high flex angles, for example above 120°, especially above 130°, or above 150°." For example, the claim ***does not*** omit the defined "surface area of contact" and claim a benefit provided by the invention hypothetically as follows:

> 16. A knee joint prosthesis for implantation in a knee joint that connects a femur and a tibia, the tibia having a tibial axis, comprising:
>
> a tibial component comprising an upper surface, a post extending from the upper surface in a direction extending generally upwardly from the upper surface, the post having a post bearing surface;
>
> a femoral component comprising a medial condyle, a lateral condyle and a cam having a cam surface, wherein ~~**(i) the post bearing surface and the cam surface define a surface area of contact and (ii) the medial condyle and the lateral condyle act against the upper surface, and wherein the surface area of contact increases**~~ when the knee flexes to a flex angle greater than 120° ***the tibial component and femoral component provide greater stability of the joint prosthesis***.

Instead, as described above, the "surface area of contact" is defined in independent claims 16 and 40 as that surface area of contact between the post bearing surface and the cam surface (when the medial and lateral condyles act against or contact the upper surface of the tibial component). The surface area of contact is thus defined as the area where two structural components—the post bearing surface and the cam surface—contact one another when the knee prosthesis is in a particular orientation. Appellants contend that surfaces are by definition structural. In turn, that surface area of contact is properly claimed (in each of independent claims 16 and 40) to increase when the knee is flexed above 120°.

In any event, even if the claim element is deemed to be "functional", such a label does not render the claim unpatentable simply because it is "functional". Revisiting §2173.05 of the MPEP: "There is nothing inherently wrong with defining some part of an invention in functional terms. Functional language does not, in and of itself, render a claim improper. *In re Swinehart*, 439 F.2d 210, 169 USPQ 226 (CCPA 1971)." Instead, "[a] functional limitation must be evaluated and considered, just like any other limitation of the claim, for what it fairly conveys to a person of ordinary skill in the pertinent art in the context in which it is used." MPEP §2173.05. In the present application, the Examiner appears to have withdrawn the substantive anticipation and obviousness rejections, which would indicate that Appellants have overcome the rejections; i.e.; that the claims in fact distinguish over the prior art. If that is the case, then simply stating that the limitations are functional does not somehow avoid the conclusion that the claim limitations as presented have distinguished the prior art.

In the event that the Examiner continues to contend that the current set of rejections stand, then Appellants submit, as described more fully in Sections A and B above, that the limitations of claims 16 and 40 do contain differentiating structure—they claim the interaction of two surfaces to achieve greater surface area of contact as the knee is flexed above 120°. That claimed structure in fact distinguishes the claim from

Takei, which describes an increase in contact surface area through a different set of structures—the side surface portions 12a of the post and the side inclined surfaces 7a of the pocket.

Appellants submit that the lack of structure argument is one without any foundation, and seek reversal of the rejections.

Conclusion:

For the reasons discussed above, Appellants request reversal of the final rejection of claims 16-46 under 35 U.S.C. § 102(e) and 103(a).

Respectfully submitted,

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Dated: October 31, 2011

Claims Appendix

1-15. (Canceled)

16. (Previously Presented) A knee joint prosthesis for implantation in a knee joint that connects a femur and a tibia, the tibia having a tibial axis, comprising:

a tibial component comprising an upper surface, a post extending from the upper surface in a direction extending generally upwardly from the upper surface, the post having a post bearing surface;

a femoral component comprising a medial condyle, a lateral condyle and a cam having a cam surface, wherein (i) the post bearing surface and the cam surface define a surface area of contact and (ii) the medial condyle and the lateral condyle act against the upper surface, and wherein the surface area of contact increases when the knee flexes to a flex angle greater than 120°.

17. (Previously Presented) The knee joint prosthesis of claim 16, wherein the upper surface further comprises a medial recess and a lateral recess , and wherein the cam of the femoral component is between the medial condyle and the lateral condyle.

18. (Previously Presented) The knee joint prosthesis of claim 17, wherein the medial condyle acts against the medial recess and the lateral condyle acts against the lateral recess during flexing of the knee, and the cam surface and the post bearing surface contact one another at a flex angle of about 90°.

19. (Previously Presented) The knee joint prosthesis of claim 18, wherein the cam surface and the post bearing surface are shaped such that the surface area of contact is approximately constant from a flex angle of about 90° to a flex angle of at least about 120°.

20. (Previously Presented) The knee joint prosthesis of claim 17, wherein the cam surface and the post bearing surface contact one another at least at flex angles greater than 120°, and wherein, at a range of flex angles that are greater than 120°, (i) the post bearing surface is convex when the post is viewed substantially along the tibial axis, and (ii) that portion of the cam surface that contacts the post bearing surface is concave when viewed substantially along the tibial axis.

21. (Previously Presented) The knee joint prosthesis of claim 20, wherein the cam surface and the post bearing surface contact one another from a flex angle of about 90° to a flex angle of at least 150°.

22. (Previously Presented) The knee joint prosthesis of claim 20, wherein the ratio of the surface area of contact when the flex angle is 150° to the surface area of contact when the flex angle is about 90° is at least about 2.0.

23. (Previously Presented) The knee joint prosthesis of claim 20, wherein the ratio of the surface area of contact when the flex angle of 145° to the surface area of contact when the flex angle is about 90° is at least about 1.3.

24. (Previously Presented) The knee prosthesis of claim 20, wherein the surface area of contact when the flex angle is less than 120° is less than about 25 mm^2.

25. (Previously Presented) The knee joint prosthesis of claim 17, wherein the medial condyle and the lateral condyle each have a posterior end, and the cam is located at or towards the posterior ends of the medial condyle and the lateral condyle.

26. (Previously Presented) The knee joint prosthesis of claim 17, wherein the cam is connected to and extends between the medial condyle and the lateral condyle.

27. (Previously Presented) The knee joint prosthesis of claim 17, wherein the cam has a generally bar-like shape.

28. (Previously Presented) The knee joint prosthesis of claim 17, wherein the cam has a generally round cross-section when viewed along the length of the cam.

29. (Previously Presented) The knee joint prosthesis of claim 28, wherein the round cross-section of the cam is interrupted in that region where the cam surface contacts the post bearing surface at flex angles greater than 120° so that, in the interrupted region, the cross-section is flattened or concave.

30. (Previously Presented) The knee joint prosthesis of claim 28, wherein the cross-section of the cam is rounded at and towards its ends, and flattened or concave in a central region between the ends of the cam where the cam surface contacts the post bearing surface at flex angles greater than 120°.

31. (Previously Presented) The knee joint prosthesis of claim 26, wherein the cam is formed integrally with a web that extends between the medial condyle and the lateral condyle, the web contacting the cam at a point where the cam does not contact the post during articulation of the joint.

32. (Previously Presented) The knee joint prosthesis of claim 20, wherein when the maximum area of the cam surface that contacts the post bearing surface extends to a point that is not more than 1.5 mm from the ends of the cam where the cam joins the condyles.

33. (Previously Presented) The knee joint prosthesis of claim 20, wherein the concavity of the cam surface is greater in the region where the cam surface acts against the post bearing surface when the flex angle is at least about 130° than in the

region where the cam surface acts against the post at flex angles lower than about 130°.

34. (Previously Presented) The knee joint prosthesis of claim 20, wherein the depth of the concave portion of the cam, measured relative to the surface of the cam at each side of the concave portion, is at least about 0.5 mm.

35. (Previously Presented) The knee joint prosthesis of claim 20, wherein the depth of the concave portion of the cam, measured relative to the surface of the cam at each side of the concave portion, is not more than 1.2 mm.

36. (Previously Presented) The knee joint prosthesis of claim 20, wherein the radius of curvature at the anterior edge of the concave portion is at least about 1.0 mm.

37. (Previously Presented) The knee joint prosthesis of claim 20, wherein the radius of curvature at the anterior edge of the concave portion is not more than about 3.0 mm.

38. (Previously Presented) The knee joint prosthesis of claim 20, wherein the radius of curvature at the anterior edge of the concave portion is not more than about 6.0 mm.

39. (Previously Presented) The knee joint prosthesis of claim 20, wherein the radius of curvature at the anterior edge of the concave region is at least about 3.0 mm.

40. (Previously Presented) A knee joint prosthesis for implantation in a knee joint that connects a femur and a tibia, the tibia having a tibial axis, comprising:

a tibial component comprising an upper surface, a post extending from the upper surface in a direction extending generally upwardly from the upper surface, the post having a post bearing surface;

a femoral component comprising a medial condyle, a lateral condyle and a cam having a cam surface, wherein (i) the post bearing surface and the cam surface define

a surface area of contact and (ii) the medial condyle and the lateral condyle contact the upper surface, and wherein the surface area of contact increases when the knee is flexed to an angle greater than 120°.

41. (Previously Presented) The knee joint prosthesis of claim 40, wherein the ratio of the surface area of contact when the flex angle is 150° to the surface area of contact when the flex angle is about 90° is at least about 2.0.

42. (Previously Presented) The knee joint prosthesis of claim 40, wherein the ratio of the surface area of contact when the flex angle of 145° to the surface area of contact when the flex angle is about 90° is at least about 1.3.

43. (Previously Presented) The knee joint prosthesis of claim 40, wherein the cam surface and the post bearing surface are shaped such that the surface area of contact is approximately constant from a flex angle of about 90° to a flex angle of at least about 120°.

44. (Previously Presented) The knee joint prosthesis of claim 40, wherein the tibial component comprises an upper surface and a post extending from the upper surface in a direction extending generally upwardly from the upper surface, the tibial component further comprises a medial recess and a lateral recess, the cam surface and the post bearing surface contact one another at least at flex angles greater than 120°, and wherein, at a range of flex angles that are greater than 120°, (i) the post bearing surface is convex when the post is viewed substantially along the tibial axis, and (ii) that portion of the cam surface that contacts the post bearing surface is concave when viewed substantially along the tibial axis.

45. (Previously Presented) The knee joint prosthesis of claim 44, wherein the cam surface and the post bearing surface contact one another from a flex angle of about 90° to a flex angle of at least 150°.

46. (Previously Presented) The knee joint prosthesis of claim 40, wherein the tibial component comprises a medial recess and a lateral recess, and wherein the cam of the femoral component is between the medial condyle and the lateral condyle.

Evidence Appendix

Neither the Examiner nor the Appellants are relying in this appeal on any evidence submitted by Appellants pursuant to 37 C.F.R. §§ 1.130, 1.131, or 1.132 during the prosecution of this application.

Related Proceedings Appendix

Pursuant to 37 C.F.R. 41.37(c)(1)(ii), Appellant, the Appellant's legal representative, or the Assignee is not aware of any decisions that have been rendered by a court or the Board in any proceeding that will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.